IN THE CLAIMS

1. (Currently Amended) A method for forming an implant having an inner core and an outer layer which comprises:

fabricating a preform with an open pore network, the network having an outer layer and an inner core;

coating at least a portion of the outer layer of the preform with a fugitive material to form an inhibition layer and leaving selected portions of the outer layer uncoated to thereby create at least one infusion channel;

infusing selected regions of the inner core with at least one infusing media;

forming an interpenetrating phase composite in the inner core; and

forming a porous outer layer by removing the fugitive material from the outer layer [~~thereby forming a porous outer layer~~].

2. (Original) The method of claim 1 wherein the preform is fabricated by sintering.

3. (Original) The method of claim 2 wherein the preform comprises a material selected from the group consisting of hydroxyapatite, bioactive glass, calcium phosphates, xenografts, allografts, autografts, isografts, ultrahigh density zirconia, zirconia toughened alumina, alumina, sapphire, titanium and gold/palladium alloys.

4. (Original) The method of claim 1 wherein the fugitive material is selected from the group consisting of polyethylene glycol, waxes, hydrogels, acrylic latexes, and other water-soluble or water-dispersible materials.

5. (Original) The method of claim 1 wherein the infusion media is selected from the group consisting of acrylates including TEGDMA, MMA, Bis GMA; thermoplastics including styrene, vinyl acetate, vinyl chloride, polyethylene, PTFE, polypropylene); epoxies (polyetherketone, polyetheretherketone, polyphenylene oxide); resorbable polymers including polylactic acid, polyglycolic acid, polycaprolactone, polytrimethylene carbonate, polydioxanone, polyiminocarbonates, polyamides, polyorthoesters, polyanhydrides, polyhydroxyalkanoates, polyhydroxybutyrate); water soluble/hydrophilics including polyvinyl alcohol, PVA-based mixtures, collagen gel/poly(alpha hydroxyacids, cellulose and waxes.

6. (Original) The method of claim 5 which comprises:

infusing the inner core with at least two infusion media.

7. (Original) The method of claim 5 which comprises:

infusing the inner core with an inorganic material selected from the group consisting of resorbable glasses and silica.

8. (Original) The method of claim 5 which comprises:

infusing the inner core with a material selected from the group consisting of drug molecules, growth factors, adhesion peptides, promotors and activators.

9. (Original) The method of claim 5 which comprises:

infusing the inner core with inorganic precursors selected from the group consisting of alkoxides, metal alkoxides, silicon alkoxides, non-silicate tetravalent metal alkoxides and sol-gel organic-inorganic hybrids.

10. (Original) The method of claim 11 which comprises:

removing the fugitive material.

11. (Original) An implant which comprises:

a preform with an open pore network, the preform having an inner core and an outer layer, the inner core infused with a polymer which forms an interpenetrating phase composite in the inner core, the preform characterized by a flexural strength, a modulus and a fracture toughness which generally matches that of a target bone host, and at least a portion of the outer layer characterized by a defined porosity.

12. (Original) The implant of claim 11 wherein the preform is comprised of a material selected from the group consisting of hydroxyapatite, bioactive glass, calcium phosphates, xenografts, allografts, autografts, isografts, ultrahigh density zirconia, zirconia toughened alumina, alumina, sapphire, titanium and gold/palladium alloys.

13. (Original) The implant of claim 11 wherein the fugitive material is selected from the group consisting of polyethylene glycol, waxes, hydrogels, acrylic latexes, and other water-soluble or water-dispersible materials.

14. (Original) The implant of claim 11 wherein the infusion media is selected from the group consisting of acrylates including TEGDMA, MMA, Bis GMA; thermoplastics including styrene, vinyl acetate, vinyl chloride, polyethylene, PTFE, polypropylene); epoxies (polyetherketone, polyetheretherketone, polyphenylene oxide); resorbable polymers including polylactic acid, polyglycolic acid, polycaprolactone, polytrimethylene carbonate, polydioxanone, polyiminocarbonates, polyamides, polyorthoesters, polyanhydrides, polyhydroxyalkanoates, polyhydroxybutyrate); water soluble/hydrophilics including polyvinyl alcohol, PVA-based mixtures, collagen gel/poly(alpha hydroxyacids, cellulose and waxes.

15. (Original) The implant of claim 11 wherein the inner core is infused with at least two infusion media.

16. (Original) The implant of claim 14 wherein the inner core is infused with an inorganic material selected from the group consisting of resoluble glasses and silica.

17. (Original) The implant of claim 14 wherein the inner core is infused with a material selected from the group consisting of drug molecules, growth factors, adhesion peptides, promotors and activators.

18. (Original) The implant of claim 14 wherein the inner core is infused with inorganic precursors selected from the group consisting of alkoxides, metal alkoxides, silicon alkoxides, non-silicate tetravalent metal alkoxides and sol-gel organic-inorganic hybrids.